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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	
	)	
BROECKEL et al.	)	Art Unit: 1761
	)	
Serial No. 09/487,000	)	Examiner: Pratt, H
	)	
Filed: March 7, 2000	)	
	)	

For: IMPREGNATED SALTS, THEIR PRODUCTION AND USE

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

BRIEF ON APPEAL

Sir:

This appeal is from the examiner's rejection of March 11, 2004.

REAL PARTY IN INTEREST

The real party in interest is BASF Aktiengesellschaft of Ludwigshafen, Germany. Reel 010747, Frame 0407, recorded on March 7, 2000.

RELATED APPEALS AND INTERFERENCES

To appellants' knowledge and belief, there are no interferences or other appeals which will directly affect or be directly affected by or have a bearing on the Board's decision in this application.

STATUS OF CLAIMS

Claims 1, 2, 4-19, 21 and 22 currently are pending. Claims 1, 2, 4-10 and 21 are rejected under 35 USC § 103(a).

STATUS OF AMENDMENTS

No amendment after the last rejection has been filed.

SUMMARY OF INVENTION

The present claims are drawn to salts of carboxylic acids which have been impregnated with from 0.5 to 30% by weight of at least one liquid carboxylic acid. The claims are also drawn to processes for producing these impregnated salts, preservatives produced from the impregnated salts, and processes for using the salts as preservatives.

ISSUES

Whether claims 1-2, 4-19, and 21 are unpatentable under 35 USC § 103 as being obvious over the disclosure of van Ooijen or Gonthier et al., in view of Kotani et al., or Kotani et al. alone.

Whether claim 22 is unpatentable under 35 USC § 103 as being obvious over the disclosure of van Ooijen or Gonthier et al., in view of Kotani et al., or Kotani et al. alone, and further in view of Gonthier et al.

GROUPING OF CLAIMS

The claims have not been argued separately, and will not be argued separately here.

ARGUMENTS

The following legal authorities are relied on in the following arguments in the order in which they are cited:

In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949,1950-51 (Fed. Cir. 1999).

REJECTION

Applicants respectfully submit that the present claims are not obvious over van Ooijen (EP 0 608 975 A1), Gonthier et al. (US 3,600,198), or Kotani et al. (US 4,122,187). The present claims are drawn to impregnated salts of a defined particle size containing a defined proportion of a liquid carboxylic acid. Impregnated salts are produced by the process of impregnation, which is described in the specification. Impregnation entails producing a solid carboxylic acid salt and applying at least one liquid carboxylic acid in such a way as to allow the liquid carboxylic acid to penetrate the crystals of the carboxylic acid salt (p.4:11-15).

Thus, the following elements are necessarily present in the amended claims. There must be at least one solid carboxylic acid salt; from 0.5 to 30%, by weight, of a liquid carboxylic acid must be added to this solid carboxylic acid salt; the particle size of the resulting impregnated salt must be from 10µm to 2000µm. Impregnation is a process that is differentiated from admixing, as may be seen in the disclosure of van Ooijen (p.3:10-15), in that in impregnation, a liquid is introduced into the solid crystalline structure of a salt, whereas in the admixture, two crystalline solids are "intimately mixed" (*id.*). A similar process for producing an admixture is found in Kotani, where the solid sorbic acid is first dissolved in heated ethanol, to which is added either an equimolar amount of potassium sorbate or 0.5 mole of potassium hydroxide per mole of dissolved sorbic acid (col.2:52-64). The mixture is then cooled, and in either variation of this process, the end result is a co-crystalline structure of two solids, as "intimately mixed"

as might be possible. An admixture is not an impregnated salt, as one of skill in the art would readily recognize.

VAN OOIJEN, ET AL. (EP 0 608 975 A1)

In addition to the above discussion, which will be applied to van Ooijen below, at least one additional point must be made. The presently claimed invention allows production of a stable composition of a carboxylic acid salt having reduced odor, yet giving a greater percentage of active ingredient upon dispersal than that described in van Ooijen. In the composition disclosed in van Ooijen, equimolar amounts of a carboxylic acid and a hydroxycarboxylate salt are combined. The hydroxycarboxylate salt is a salt of the desired active ingredient, and the carboxylic acid is *of necessity* a different substance. Not only is the carboxylic acid different from the desired active ingredient, but it is also bound by the alkali(ne earth) metal ion dissociated from the hydroxycarboxylate upon dispersion in a solvent.

Thus, the amount of active ingredient able to be released into the solvent is, at a maximum, only *half* of the entire amount of the dissolved composition. For instance, in the single example of van Ooijen, an effective amount of 5.11g of lactic acid, in the form of 6.7g (1 mol water) calcium lactate was mixed with 3.3 g fumaric acid and dissolved in 100ml water. The yield of lactic acid from calcium lactate is reported to be over 94%, i.e., 4.76 and 4.86 in the two iterations, and yet this yield of lactic acid is only approximately 56% of the total weight of the calcium lactate/fumaric acid mixture. 44%

of the mixture is, at best, an inert filler which serves to guarantee release of the lactic acid. In practical application, the presence of this additional component reduces the efficiency of total weight to active ingredient conversion, and may disrupt certain processes or require additional steps to remove the resulting carboxylate salt (van Ooijen, p.2:37-44). In other words, only approximately half of any optimal van Ooijen mixture is active ingredient, as the carboxylic acid serves to sequester the alkali(ne earth) metal ions, becoming no more than an inert support or filler, and its presence may introduce unnecessary complications. The conception of van Ooijen's invention as "a method of storing and using hydroxycarboxylic acids ... releasably bound on a support" underscores the extent to which the resulting carboxylate becomes an inert and possibly troublesome ingredient (*id.*, p.2:1-2).

Further, the preferability of from 40-60% carboxylic acid is vital to the efficient performance of the product. The mechanism of action described in van Ooijen requires that the carboxylic acid combine with the alkali(ne earth) metal ion released from the hydroxycarboxylate salt (*id.*, p.2:26-32). This ensures that the hydroxycarboxylic acid released will not revert to its salt form (*ibid.*). If a higher percentage of carboxylic acid is included in the composition, a higher *yield* of hydroxycarboxylic acid may result, as all alkali(ne earth) metal ions will be bound by the excess of carboxylic acid, and yet the overall *amount* of hydroxycarboxylic acid produced per unit of weight of the mixture will be less. Similarly, if a lower percentage of carboxylic acid is included in the composition, the hydroxycarboxylic acid yield will be lower, depending on the reaction

conditions, as less carboxylic acid will be available to bind the released alkali(ne earth) metal ions. In this latter case there may be more hydroxycarboxylic acid theoretically available in the composition, and yet its release would be dependent on reaction conditions, rather than 'guaranteed' through the presence of the ion-binding acid having a lower pKa.

Whether the proportion of carboxylic acid is higher or lower than 40-60%, the effectiveness and efficiency of release of the hydroxycarboxylic acid is lowered. Accordingly, even though van Ooijen discloses a theoretical carboxylic acid range of from 1 to 90%, one of skill in the art would recognize that the invention described therein is only effective where the actual range is significantly more narrow, approaching 50%. Given the similarities in molecular weights between the acids and salts described in van Ooijen, it is not likely that an equimolar amount of any contemplated carboxylic acid would be outside the range of 40 to 60% by weight. Accordingly, there is no reasonable expectation for success in employing the carboxylic acid in amounts between 0.5 and 30% by weight. Rather, such a composition would result in lower yields and/or less predictability in producing a desired amount of a hydroxycarboxylic acid. No individual of ordinary skill in the art would be motivated by the van Ooijen disclosure to produce a carboxylic acid/alkali(ne earth) metal hydroxycarboxylate salt mixture in the proportions required by the present claims. Such a mixture would not produce the predictability and yield reported and sought by van Ooijen.

Van Ooijen, does not therefore, disclose that the range of carboxylic acid in an impregnated hydroxycarboxylate salt should be restricted to from 0.5 to 30% by weight. The range disclosed in van Ooijen is from 1 to 90% by weight, with a preference for from 40 to 60% by weight, and a stated optimum where an equimolar amount of a carboxylic acid is impregnated into a hydroxycarboxylate salt. Van Ooijen does not mention an upper boundary of 30%, but through discussion of the mechanism of action and preferred ranges, indicates that such an amount would be inefficient for storing hydroxycarboxylic acids in a releasably-bound state.

Further, van Ooijen does not disclose any specific particle size. The present invention shows that such a particle size restriction improves the storage, flow, and processing properties of the impregnated salt.

For the above reasons, applicants respectfully request that the rejection of claims 1, 2, 4-19, and 21-22 under 35 USC §103(a) based on van Ooijen (EP 0 608 975 A1) be withdrawn.

GONTHIER ET AL. (US 3,600,198)

The Gonthier, et al. reference, likewise, does not teach or suggest an impregnated salt of a carboxylic acid. The examiner has pointed to no clear, express statement in the Gonthier reference indicating that a carboxylate salt is impregnated with a liquid carboxylic acid. If the examiner is relying on an argument of inherency, i.e., that an impregnated carboxylic acid salt is *necessarily* present in Gonthier, there has

been no showing of objective evidence or reasons as to why one of skill in the art would agree that an impregnated carboxylic acid salt is *required* by or *necessarily present* in that disclosure. Gonthier discloses

> ice or an aqueous solution containing a mixture of propionic acid and benzoic acid buffered to a pH less than 7 by adding to the acids their corresponding salts of alkali metals or magnesium ...
>
> a mixture of propionic acid and benzoic acid buffered with their corresponding salts of alkali metals or of magnesium ...
>
> mixtures of a buffered mixture of propionic acid/metal propionate and of a buffered mixture of benzoic acid/metal benzoate the total pH of which is lower than 7 and preferably between 4 and 5 ...
>
> propionic acid-sodium propionate and benzoic acid-sodium benzoate; propionic acid-magnesium propionate and benzoic acid-sodium benzoate; propionic acid-sodium propionate and benzoic acid-magnesium benzoate; and propionic acid-magnesium propionate and benzoic acid-magnesium benzoate ...
>
> water to which had been added 2 g./l. of a mixture A having 95 parts *(by volume)* of the buffered propionic acid/sodium propionate of pH 4.5 and 5 parts *(by volume)* of the buffered benzoic acid/sodium benzoate of pH 4.5 ...
>
> 2 other germicidal ices from a 2 g./l. aqueous solution, containing either the buffered mixture (B): propionic acid/sodium propionate of pH 4.5 or the buffered mixture (C): benzoic acid/sodium benzoate of pH 4.5 ...
>
> aqueous solutions containing 2 g./l. of ... D: buffered system: propionic acid-sodium propionate at pH 4.5 ... E: propionic acid/sodium propionate plus benzoic acid-sodium benzoate with pH 4.5; the ratio *by volume* of the two constituents being 70/30 ...
>
> aqueous solutions containing 50 g./l. of the products D and E ...
>
> aqueous solutions containing 2 g./l. of the following products (pH=4.5): ... F: propionic acid-magnesium propionate ... G: 95 parts *(volume)* of the buffered: propionic acid-magnesium propionate and 5 parts of the buffered: benzoic acid-sodium benzoate ...H: 50 parts *(volume)* of the buffered: propionic acid-magnesium propionate and 50 parts of the buffered: benzoic acid-sodium

> benzoate ...
>
> buffered *solution*: propionic acid-Mg propionate. (col.1:14-18, 49-51, 53-56, 58-63, col.3:10-14, 16-19, 62-69, col.4:3-4, col.4:17-26, 46, emphasis supplied).

It is not clear from these disclosures *where*, in particular, Gonthier discloses the *necessary* existence of a carboxylate salt impregnated with from 0.5 to 30% of a liquid carboxylic acid. It is further unclear where Gonthier suggests producing an impregnated salt over, for instance, an admixture or a solution. It is clear from the emphasized phrases above that the mixture employed in 2 g./l. increments is also seen as having a *volume* measurement.

From the Gonthier disclosure it is evident that aqueous solutions containing propionic and benzoic acids and their salts are produced. It is not evident, however, that an impregnated carboxylic acid salt was ever produced or even contemplated therein. As stated by the Federal Circuit,

> To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient."

(*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949,1950-51 (1999).) Unless the examiner can set forward extrinsic evidence or rationale showing the existence of an impregnated carboxylate salt according to the present claims, the rejection based on Gonthier is fatally incomplete. Accordingly, applicants respectfully request that the rejection under 35 USC §103(a) based on Gonthier be withdrawn.

KOTANI ET AL. (US 4,122,187)

As indicated above, the present claims are drawn to carboxylate salts impregnated with from 0.5 to 30% of a liquid carboxylic acid. Kotani discloses sorbic acid compositions including "double salts" of sorbic acid with sodium or potassium sorbate or with sodium or potassium salts of organic or inorganic acids (col.2:42-52). Sorbic acid is a solid at normal processing temperatures and cannot, therefore, be a liquid carboxylic acid impregnated into the sorbate, organic, or inorganic salts. Again, if the examiner is arguing that an impregnated salt is *necessarily* present in this disclosure, or that the characteristics of an impregnated salt are *necessarily* present in the disclosed double salts of Kotani, the burden remains on the examiner to establish this point.

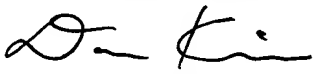
The sorbic acid in Kotani is heated and dissolved in ethanol, combined with potassium sorbate under heat, and this mixture is then cooled. The examiner has not established that the resulting co-crystalline compound *necessarily* posesses the characteristics of an impregnated carboxylate salt as presently claimed, or that one of skill in the art would recognize this to be the case. Without adequate rationale and/or objective evidence, the examiner's rejection is incomplete. Applicants respectfully request that the rejection based on Kotani et al. be withdrawn.

CONCLUSION

In view of the foregoing, applicants request that reversal of examiner's rejection of present claims is in order.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit any excess fees to such deposit account.

Respectfully submitted,
KEIL & WEINKAUF



Daniel S. Kim
Reg. No. 51877

1350 Connecticut Ave., N.W.
Washington, D.C. 20036
(202)659-0100

DSK/sb

APPENDIX

1. Impregnated salts with a particle size of 10µm to 2000µm comprising at least one salt of one or more carboxylic acids, which salt has been impregnated with from 0.5 to 30% by weight, based on the carboxylic acid salt, of at least one liquid carboxylic acid.

2. Impregnated salts as claimed in claim 1, comprising at least one salt of a C_1-C_8-mono- or dicarboxylic acid, which salt has been impregnated with at least one C_1-C_8-mono- or dicarboxylic acid.

3. (canceled)

4. Impregnated salts as claimed in claim 1, where the carboxylic acids in the carboxylic acid salts and the carboxylic acid used for impregnating the salts are identical.

5. Impregnated salts as claimed in claim 1, wherein the impregnated salts comprise at least one salt selected from the group of ammonium, potassium, sodium, lithium, magnesium or calcium salts.

6. A preservative comprising an impregnated salt as claimed in claim 1.

7. A preservative as claimed in claim 6, additionally comprising a carrier.

8. A preservative as claimed in claim 6, which is coated with a protective agent which is soluble or swellable in water at 20°C.

9. A preservative as claimed in claim 6, wherein water-soluble polymers, organic acids, their salts or low-melting inorganic salts are used as protective agents.

10. A preservative as claimed in claim 6, further comprising a protective agent selected

from the group consisting of polyethylene glycols, polyvinylpyrrolidones, C_3-C_{14} organic acids and their salts, and amino acids and their salts.

11. A preservative as claimed in claim 6, wherein a dusting powder is applied to the surface in addition to or in place of the protective agent.

12. A process for producing impregnated salts as claimed in claim 1, which comprises impregnating at least one salt of a carboxylic acid or of a mixture of carboxylic acids, with at least one liquid carboxylic acid until the concentration is 30% by weight based on the carboxylic acid salt.

13. A process as claimed in claim 12, wherein at least one carboxylic acid is introduced into a mixer, and at least one salt of a carboxylic acid or of a mixture of carboxylic acids is metered in.

14. A process for producing a preservative, which comprises mixing impregnated salts as claimed in claim 1 with one or more carriers and/or formulation auxiliaries, and agglomerating with or without the addition of at least one binder.

15. A process as claimed in claim 14, wherein the preservative is coated with a protective agent which is soluble or swellable in water at 20°C and/or if required the flow characteristics of the preservative are ensured by dusting with a finely dispersed dusting powder.

16. A process for preserving human and animal food, wherein the impregnated salts as claimed in claim 1, or the preservatives are added to the human or animal food.

17. A preservative as claimed in claim 6, additionally comprising formulation auxiliaries.

18. A preservative as claimed in claim 10, wherein the protective agent is selected from the group consisting of C_3-C_6 organic acids and their salts.

19. A preservative as claimed in claim 18, wherein the protective agent is selected from the group consisting of citric acid, fumaric acid, succinic acid, adipic acid, benzoic acid and their salts.

20. (canceled)

21. A process for acid treatment wherein the impregnated salts of claim 1 or the preservatives are introduced into or placed on an item to be treated.

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THE UNITED STATES PATENT AND TRADEMARK OFFICE
Re: Appeal to the Board of Appeals

In re Application of			
BROECKEL		Art Unit:	1761
Serial No.	09/487,000	Examiner:	Pratt, H.
Filed:	March 07, 2000		

For: **IMPREGNATED SALTS, THEIR PRODUCTION AND USE**

To: Hon. Commissioner of Patents and Trademarks

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D. C. 20036, on:

August 16, 2004
Date of Deposit

Sabine Berg
Person Making Deposit

Signature

1. [ ] NOTICE OF APPEAL: Applicant hereby appeals to the Board of Appeals from the decision dated _____ of the Primary Examiner finally rejecting claims ____.
2. [ ] A check to cover the extension fee of $____ is enclosed.
3. [x] BRIEF on appeal in this application is transmitted herewith.
4. [ ] An Oral Hearing is requested.
   [ ] The Oral Hearing fee of $280.00 is enclosed.
5. [X] Fee $330.00
   [X] Enclosed
   [ ] Not required (Fee paid in prior appeal)
   [ ] Charge to Deposit Account No. 11-0345.
6. [X] The Commissioner is hereby authorized to charge any fees which may be further required, or credit any over payment to Account No. 11-0345. A duplicate copy of this sheet is attached.

Respectfully submitted,
KEIL & WEINKAUF

By _____
Daniel S. Kim
Reg. No. 51877

1350 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 659-0100
HBK/sb